

REMARKS

Claims 1-18 are pending in the present Application. Claim 10 has been canceled, Claim 4 has been amended, no claims have been added, and Claims 1-3 have been withdrawn, leaving Claims 1-18 for consideration upon entry of the present amendment. A request for continued examination under 37 C.F.R. 1.114 accompanies this amendment.

Claim 4 has been amended to recite wherein a pH of the stripping composition is about 1.6 to about 5. Support for this amendment can be found in Claim 10, canceled herewith.

Claim 15 has been amended to correct an inadvertent typographical error.

No new matter has been introduced by the amendments.

The Applicants again wish to thank the Examiner for the allowance of Claims 16-18. Applicants believe also that in light of the above amendments and the remarks below, the Examiner will also find the remaining pending claims to be allowable as well.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 4-15 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 6,699,330 (“Muraoka”) in view of U.S. Patent Application Publication No. 2002/0132451 (“Akino”). Applicants respectfully traverse this rejection.

Muraoka discloses a method of stripping surface-deposited organic contaminants such as e.g., novolak resist and DOP (i.e., dioctyl phthalate, also referred to as 2-ethylhexyl phthalate), using a stripping composition of an organic solvent with a partition coefficient of 0.6 toward ozone, where the ozone is *dissolved* in the solvent. Col. 4, lines 6-12; emphasis added. Acetic acid is used as the organic solvent. Col. 4, lines 25-29; col. 6, lines 57-66. The stripping composition is used as a “running film” over the surface to be stripped, and is replenished constantly or at intervals. Col. 4, lines 13-23. Muraoka teaches that the ozone concentration may be 100 ppm or higher in the stripping solution, and discloses ozone values of 280 ppm and 220 ppm for acetic acid stripping solutions which decreases with decrease in acetic acid concentration. Muraoka, Col. 6, lines 33-37; FIG. 6. Muraoka also teaches bubbling ozone through glass filter into the solution to reach a concentration close to saturation, and with enhancement, “up to nearly

400 ppm". Col. 7, 24-27. It will be appreciated by one skilled in the art that "nearly 400 ppm" thus represents a practical upper limit for a saturated solution ozone concentration required by the disclosure of Muraoka. Muraoka further discloses acetic acid concentration in % by weight from 0 to 100% in the stripping composition over time, and shows data that correlate stripping rate and ozone concentration to concentrations of acetic acid of 50 to 100 wt%. FIG 6, x-axis.

Akino discloses a method to prevent chipping of a substrate and accompanying debris by removing the outer peripheral portion of a semiconductor substrate to produce a stepped profile. Abstract. Wet etching of the end of a silicon layer 3 (FIG. 5C) is disclosed using a tetramethylammonium hydroxide solution, or a mixture of hydrofluoric acid and nitric acid; or using a dry etch (reactive ion etch, RIE; chemical dry etching, CDE) which use CF₄ (carbon tetrafluoride) or SF₆ (sulfur hexafluoride) and/or oxygen. Akino, [0076]. Akino further discloses etch of silicon oxide film using buffered hydrofluoric acid ("BHF"); or dry etch using CF₄, CHF₃, or H₂ gases, or mixtures with chlorine gas. Akino, [0054], [0079]. One skilled in the art will appreciate that these etch compositions or gas mixes are used in the art for silicon or silicon oxide etch, and are not applied to organic stripping processes.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, or knowledge generally available in the art at the time of the invention, must provide some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). "A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). To find obviousness, the Examiner must "identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does." *Id.*

Muraoka in view of Akino fails to teach all elements of the instant claims.

Claim 4 as amended includes the limitations of Claim 10, which claims a pH of the stripping composition of 1.6 to 5. Muraoka discloses use of acetic acid, specifically in amounts of 50 to 100 wt%; however, there is no disclosure in Muraoka of a pH for the composition, or in Akino, which discloses TMAH, HF, nitric acid, and buffered HF but fails to disclose either acetic

acid or pH. For this reason at least, Akino fails to remedy the deficiencies of Muraoka, and the combination fails to teach all elements of the instant claims and cannot render the instant claim 4 *prima facie* obvious.

Muraoka in view of Akino fails to provide a suggestion or incentive that would lead one skilled in the art to modify the composition of Muraoka and Akino, to provide the stripping composition and method of Claim 4. Muraoka discloses acetic acid but does not specify the pH of the stripping composition. Akino discloses basic solutions of TMAH, of HF, nitric acid, or buffered HF, but fails to teach or disclose either acetic acid or a pH of the stripping composition claimed in Claim 1 of 1.6 to 5. Akino thus, in addition to failing to remedy the deficiencies of Muraoka, fails to provide a suggestion or incentive that would motivate one skilled in the art to modify Muraoka in view of Akino to provide the missing limitation of a pH of 1.6 to 5.

Muraoka itself fails to provide a suggestion or incentive that would lead one skilled in the art to so modify Muraoka, or Muraoka in view of Akino. Muraoka discloses use of acetic acid, and a *non-polar* organic solvent. Col. 6, lines 8-10. Muraoka also expressly states that any solvent having a good partition coefficient can be used “as long as it is an organic solvent”, and discloses organic solvents including fatty acids (i.e., acetic, propionic, butyric acid) and dichloromethane. Col. 6, lines 22-32. Muraoka does not disclose a pH for the solvent, and does not disclose how such a property would be obtained as the solutions of Muraoka are organic. As disclosed in the Specification on p. 11, lines 11-18, the pH of the acetic acid in the stripping composition of the present invention exists in the range of about 1.6 to about 5. In an exemplary embodiment, the acetic acid used in the stripping composition has a pH of 2. See Specification, p. 14, lines 5-6. It is disclosed in the instant Specification that photoresist may be lifted off by the ozone under a strong acidic atmosphere, and the photoresist is transformed to a carboxylic acid by the ozone so that oxidation-reduction potential is no less than about 1V while the pH is no more than about 5. Muraoka is silent as to these teachings and cannot provide a suggestion or incentive that would lead one skilled in the art to modify Muraoka to provide these limitations. Muraoka, or Muraoka in view of Akino, thus fails to disclose all elements of the instant claim 4 and fails to provide a suggestion or incentive that would have led one skilled in the art to modify Muraoka, or Muraoka in view of Akino, to provide the missing elements. Reconsideration and allowance of Claim 4 and its dependents is respectfully requested.

With regard to Claim 6, Muraoka discloses bubbling ozone through an acetic acid solution to prepare the solution with ozone present at up to the saturation point (i.e., about 400 ppm) but fails to disclose that the bubbles of the solution participate in the stripping process, while instead extensively disclosing a flowing film solution process that is dramatically different from the process claimed by Applicants. Akino is silent as to bubbling ozone to prepare a stripping composition. Hence Akino fails to remedy the deficiencies of Muraoka with regard to Claim 6 as well.

Further, there is no reasonable expectation that modifying Muraoka and Akino to provide the invention of the instant claims, particularly Claim 6 as instantly claimed, would meet with success. Based on the disclosure of Muraoka, there is no indication that including ozone in excess of the saturation point in Muraoka would still provide Muraoka with a functioning stripper composition, as taught by Muraoka. The courts have held that “[i]f the proposed modification would render the prior art invention being modified unsatisfactorily for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon* 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir. 1984). The courts have also held that ‘[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious.’” *In re Ratti* 270 F. 2d 810, 123 USPQ 349 (CCPA 1959). Thus, the modification of Muraoka and Akino with the bubbled ozone of the instant claims would affect the functioning of Muraoka and would not provide a reasonable expectation for success for the combination.

As presented previously, Applicants observed a stripping rate of 6 $\mu\text{m}/\text{min}$ and that “the stripping rate of the stripping composition of the invention is greatly superior to that of the stripping composition including ozone and the ultra pure water.” The applicants respectfully maintain that the unexpected stripping rate observed by the applicants supports a finding of nonobviousness. One skilled in the art will also appreciate that the superior results achieved by Applicants is therefore not mere optimization of parameters found in Muraoka, but represents the application of a method dramatically different from that disclosed in Muraoka and Akino, where Applicant’s method is not taught in the references. Hence, no reasonable expectation for the success for the combination of Muraoka and Akino would be expected, to compare with that

obtained by Applicants.

Thus for at least the above reasons, the combination of Muraoka and Akino fails to render the instant claims unpatentable, and neither reference remedies the deficiencies of the other. Thus the instant claims 4-9 and 11-15 are not unpatentable over the combination of Muraoka in view of Akino. Reconsideration and allowance of the claims is respectfully requested.

Claim 12 also stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Muraoka in view of Akino, and further in view of U.S. Patent Application Publication No. 2003/0045037 (“Mei”). Applicants respectfully traverse this rejection.

Mei discloses a memory device with gate electrodes, which comprise Al/Cr. FIG. 11, ref. numeral 506.

Mei discloses CVD/PECVD deposition processes (e.g., [0094]), but is silent as to stripping processes and is in particular silent as to stripping compositions comprising acetic acid comprising bubbled ozone or to pH of the stripping composition, as claimed in the instant claims, and thus for reasons disclosed hereinabove, fails to remedy the deficiencies of Muraoka and Akino. Thus, the combination of Muraoka, Akino, and Mei fails to render the instant claims unpatentable.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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